

Flexible 2-Phase Thermal Strap for Small Sats, Phase I

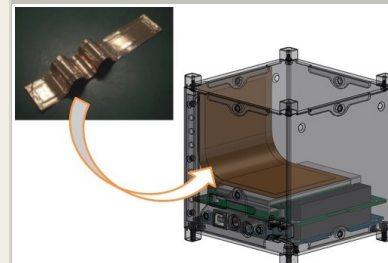
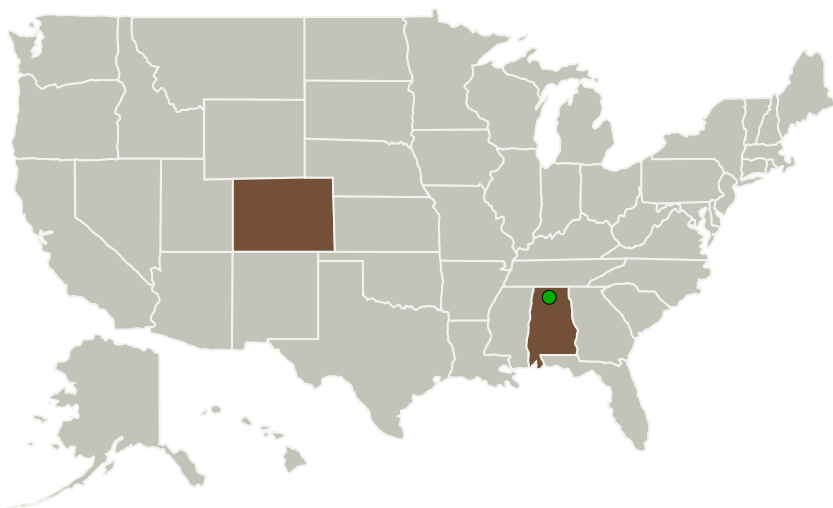
Completed Technology Project (2015 - 2015)



Project Introduction

A rapidly growing class of spacecraft are CubeSats and SmallSats. Current NASA missions indicate an equally rapid growth of technological capabilities to support these small spacecraft. However, large deployable solar arrays and closely packed electronic suites are giving rise to an increasing demand for thermal management technologies in CubeSats and SmallSats. NASA is currently seeking more sophisticated thermal control technologies for this class of spacecraft, thus enabling revolutionary capabilities within small satellites. In response to the need for advanced heat transfer components for improved thermal management onboard CubeSats and SmallSats, i2C Solutions proposes to develop space-rated flexible 2-phase thermal straps with vacuum survivability and operational capability. The current effort will build upon current and previous Department of Defense-funded developments of 2-phase thermal management components with thermal conductivities in excess of 1500 W/m-K and thicknesses of less than 1-mm. Additionally, a world-class CubeSat team including LoadPath, leaders in the thermal analysis of SmallSats, has been assembled to assist in application development and demonstration. The Phase I program will culminate with a proof-of-concept demonstration of a 2-phase thermal strap designed and manufactured for operation in the harsh space environment. The successful development of the proposed space-rated thermal strap will open the door to a new class of future CubeSat and SmallSat missions.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
i2C Solutions	Lead Organization	Industry	Louisville, Colorado
● Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

Primary U.S. Work Locations	
Alabama	Colorado

Project Transitions

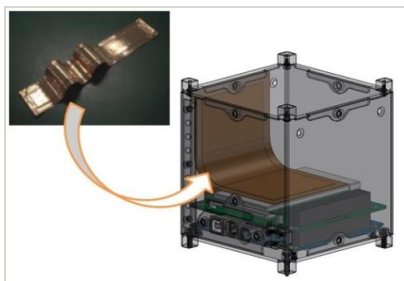
**June 2015:** Project Start**December 2015:** Closed out

Closeout Summary: Flexible 2-Phase Thermal Strap for Small Sats, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image(<https://techport.nasa.gov/file/139011>)

Images

**Briefing Chart Image**

Flexible 2-Phase Thermal Strap for Small Sats, Phase I
(<https://techport.nasa.gov/image/135682>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

i2C Solutions

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

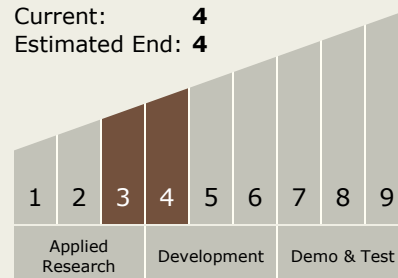
Carlos Torrez

Principal Investigator:

Michael Hulse

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.2 Thermal Control Components and Systems
 - └ TX14.2.2 Heat Transport

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System